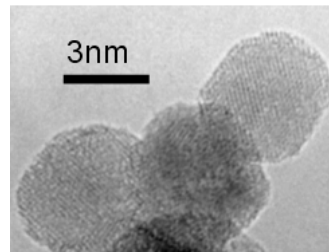


# D-Tribo™ Nanodiamond-based Nanoengineered Oil Additive



## Detonation Nanodiamond (DND)

Detonation nanodiamonds are ultra-nanocrystalline particles produced in bulk quantities by the detonation of carbon-containing explosives. The characteristic size of primary particles is ~ 4 nm, which can be isolated from large sized aggregates produced during synthesis. Preliminary investigations demonstrate that DND is non-toxic and safe.



## Why use DND in engine oils?

Benefits of D-Tribo include:

- Increased fuel efficiency (5-10%)
- Decreased wear (2-3x)
- Increased time between oil changes
- Engine running cooler
- Supporting Green technology

**How it works** – One factor in the fuel efficiency of a motor vehicle is the friction between engine components. By reducing the friction, the fuel efficiency of gasoline and diesel engines increases without the need for other modifications. The nanoengineered lubricant oil additive, D-Tribo™, conditions and forms a protective layer on engine surfaces which dramatically decreases the friction coefficient, reduces the engine temperature and reduces the wear rate, which results in a longer engine life. D-Tribo™ improves the lifetime of the oil decreasing the required frequency of oil changes.

## Application procedure

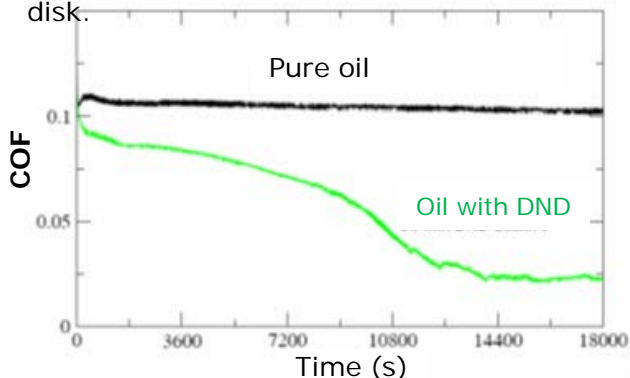
- Add D-Tribo™ (4oz per 1Gallon of engine oil) into engine oil (preferably into warm oil after several minutes of running engine).
- Run your car 20 minutes to ensure good mixing of the additive and your oil.
- The maximum benefit will be observed after approximately the first 200 miles of driving.
- D-Tribo™ Engine Treatment can be used at every oil change. Once the engine surfaces are conditioned, increased fuel efficiency should be obtained for an extended period of time even without the addition of D-Tribo™ at every oil change (apply D-Tribo after every second oil change).



*D-Tribo™ in a PAO-6 oil base*

## Results validated by:

- Field testing in passenger cars
- OEM approved computerized bench Fuel Efficiency test on engines. Testing protocols included "city cycle" and high speed cruise (4.5% FE).
- Lab tests: ASTM D2714 test using Block-on-Ring machine (UMT-3), 4-ball test, ring-on-disk.



Coefficient of friction (COF) measured as a function of time in block on ring test apparatus for pure Mobil Super 5W30 oil and Mobil containing D-Tribo Additive (DND).